PATENT COOPERATION TREATY

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To: DR. S. BANNAN
GEC HEALTH CARE
AMERSHAM PLACE
LITTLE CHALFONT
BUCKINGHAMSHIRE
HP7 9NA

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COMMUNICATION IN CASES FOR WHICH NO OTHER FORM IS APPLICABLE

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Applicant's or agent's file reference: PA984A

REPLY DUE: See paragraph 1 below

International application No.: PCT/GB1999/004410

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Applicant: NYCOMED AMERSHAM PLC (et al)

1. ☐ REPLY DUE within _____ months/days from the above date of mailing
☒ NO REPLY DUE, however, see below
☐ IMPORTANT COMMUNICATION
☒ INFORMATION ONLY

DUE DATE
[illegible] KF
[illegible] SB
CASE NO: P29848-PCT

2. COMMUNICATION:

Further to our conversation and your facsimile of the 18th January 2007 concerning the above-mentioned PCT application.

As requested, I enclose a copy of page 1 of the faxed description for your informational retention.

Finally, I confirm said page was page 1 of the faxed application/specification received at the RO/GB on the 23rd December 1999. (23-12-99.), thus being the International filing date of said case.

Name and mailing address of the ISA/RO: The Patent Office
Cardiff Road, Newport
South Wales NP10 8QQ

Facsimile No.

Authorized officer: J. R. LLOYD-THOMAS
ROOM: GY19 EXT: ~~4040~~ 4036

Telephone No.

Form PCT/RO/132 (July 1992; reprint January 2004)

IN VITRO NMR METHOD

This invention is concerned with nuclear magnetic resonance spectroscopy. The technique involves observing the spectrum of a NMR active nuclear species, particularly a hyperpolarised nucleus, in order to obtain information about the environment in which the species is present. The spectra of NMR active nuclei vary depending on their environment, as reported in the literature (PNAS, 93, 12932-6, 1996).

Noble gases having non-zero nuclear spin can be hyperpolarised, i.e. have their polarisation enhanced over the equilibrium polarisation, e.g. by the use of circularly polarised light. Preferred techniques for hyperpolarisation include spin exchange with an optically pumped alkali metal vapour and metastability exchange. Noble gases to which this technique can be applied include ^{3}He and ^{129}Xe. As described by M S Albert *et al* in US Patent 5,545,396, the technique can be used to prepare hyperpolarised noble gases which can then be administered by inhalation for magnetic resonance imaging of the human body.

It is known that the hyperpolarisation of a noble gas can be transferred to another NMR active species by physical contact. Thus WO 97/37239 (Lawrence Berkeley National Laboratory) describes a method which involves: contacting a sample containing an NMR active nucleus with a hyperpolarised noble gas; scanning the sample using nuclear magnetic resonance spectroscopy, magnetic resonance imaging, or both, in order to detect the NMR active nucleus. WO 98/30918 (Nycomed Imaging AS) relates to *ex-vivo* dynamic nuclear polarisation (DNP) of the NMR active nuclei of an MR imaging agent by a hyperpolarised gas where the gas is separated from the MR imaging agent prior to administration to the body.

The present invention concerns the hyperpolarisation of one or more NMR active nuclei of compounds involved in an assay. The hyperpolarisation may be carried out using a variety of techniques, such as polarisation transfer from a noble gas, "Brute force", DNP (WO 98/58272, Nycomed Imaging AS) and the para hydrogen ($p\text{-}H_2$) method, as explained below.

The transfer of hyperpolarisation according to the present invention may be achieved by using a hyperpolarised noble gas, preferably ^{3}He or ^{129}Xe, or a mixture of such gases, to effect